1. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

   Pringles wants to add 42 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

   A. About 21 percent

   B. About 12 percent

   C. About 19 percent

   D. About 3 percent
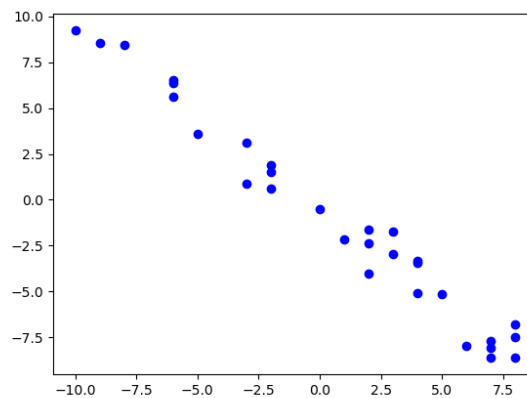
   E. None of the above

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2. Solve the modeling problem below, if possible.

   A new virus is spreading throughout the world. There were initially 5 many cases reported, but the number of confirmed cases has quadrupled every 2 days. How long will it be until there are at least 100000 confirmed cases?

   A. About 8 days

   B. About 15 days

   C. About 9 days

   D. About 20 days

   E. There is not enough information to solve the problem.

   3.

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4. Determine the appropriate model for the graph of points below.

A. Logarithmic model

B. Linear model

C. Non-linear Power model

D. Exponential model

E. None of the above

5. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 47 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

A. About 24 percent

B. About 21 percent

C. About 14 percent

D. About 4 percent

E. None of the above

6. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 30 liter 9 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 5 percent and 33 percent solutions, what was the amount she used of the 33 percent solution?

A. $15.00 liters$

B. $4.29 liters$

C. $16.92 liters$

D. $25.71 liters$

E. There is not enough information to solve the problem.

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7. Using the scenario below, model the population of bacteria α in terms of the number of minutes, t that pass. Then, choose the correct approximate *(rounded to the nearest minute)* replication rate of bacteria-α.

   A newly discovered bacteria, α, is being examined in a lab. The lab started with a petri dish of 3 bacteria-α. After 1 hours, the petri dish has 105 bacteria-α. Based on similar bacteria, the lab believes bacteria-α quadruples after some undetermined number of minutes.

   A. About 70 minutes

   B. About 138 minutes

   C. About 23 minutes

   D. About 11 minutes

   E. None of the above

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8. Solve the modeling problem below, if possible.

   In CHM2045L, Brittany created a 28 liter 25 percent solution of chemical χ using two different solution percentages of chemical χ. When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 17

*percent and 32 percent solutions, what was the amount she used of the 32 percent solution?*

A. $14.93 liters$

B. $13.70 liters$

C. $13.07 liters$

D. $14.00 liters$

E. There is not enough information to solve the problem.

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9. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 8 many cases reported, but the number of confirmed cases has quadrupled every 5 days. How long will it be until there are at least 10000 confirmed cases?

A. About 36 days

B. About 26 days

C. About 15 days

D. About 14 days

E. There is not enough information to solve the problem.

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10. Determine the appropriate model for the graph of points below.
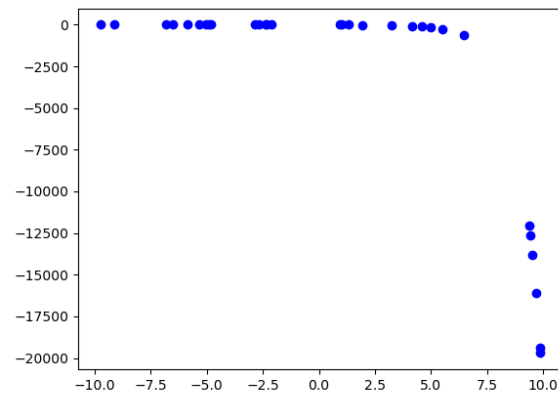
A. Linear model

B. Logarithmic model

C. Exponential model

D. Non-linear Power model

E. None of the above